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Education

2021-2024 **EPFL (École Polytechnique Fédérale de Lausanne)**, *Switzerland*,
MSc. Computational Science and Engineering,
Master Thesis: Investigating Tokenization Techniques for Improving Multimodal Foundation Models
GPA: **5.59/6**

2017-2021 **Sharif University of Technology**, *Iran*,
BCs. Computer Engineering,
Bachelor Thesis: Neural Distributed Image Compression using Common Information
GPA: **19.08/20 (Top 10%)**

Publications & Preprints

2023 **4M-21: An Any-to-Any Vision Model for Tens of Tasks and Modalities**,
Roman Bachmann, Oğuzhan Fatih Kar*, David Mizrahi*,* **Ali Garjani**, *Mingfei Gao, David Griffiths, Jiaming Hu, Afshin Dehghan, Amir Zamir*,
arxiv 2024, [Website],[arXiv],[GitHub]

2022 **Neural Distributed Image Compression using Common Information**,
Nitish Mital, Ezgi Özyılkan*,* **Ali Garjani***, *Deniz Gunduz*,
Data Compression Conference (**DCC**), 2022, [arXiv], [GitHub]

2022 **Neural Distributed Image Compression with Cross-Attention Feature Alignment**,
Nitish Mital, Ezgi Özyılkan*,* **Ali Garjani***, *Deniz Gunduz*,
Workshop on Applications of Computer Vision (**WACV**), 2023, [arXiv], [GitHub]

2021 **Forecasting Influenza Hemagglutinin Mutations Through the Lens of Anomaly Detection**,
Ali Garjani, *Atoosa Malemir Chegini, Mohammadreza Salehi, Alireza Tabibzadeh, Parastoo Yousefi, Mohammad Hossein Razizadeh, Moein Esghaei, Maryam Esghaei, Mohammad Hossein Rohban*,
Scientific Reports Journal - **Nature**, 2023, [arXiv], [GitHub]

* Equal Contribution

Research Experience

2024 Feb - Present **Research Intern at Visual Intelligence and Learning Lab**, *EPFL*,
Advised by Prof. Amir Zamir,
Project: Physical Mulitmodal Self-Supervised Learning
- Train a multimodal SSL model, that only operates on modalities that are available via real-world sensors. The desired outcome would be to have that system transfer well on unseen modalities.

2023 Feb - Dec **Research Lab Assistant at Visual Intelligence and Learning Lab**, *EPFL*,
Advised by Prof. Amir Zamir,
Project: 4M-21: An Any-to-Any Vision Model for Tens of Tasks and Modalities
- Trained a **multimodal** multitasked **foundation model**. To do so, different modalities are first mapped to a disceret representation (tokens) using a **tokenizer**. Then modalities' tokens are trained jointly with a **masked modeling** objective using a transformer encoder-decoder.

2022-2023 **Research Project at Image and Visual Representation Lab**, *EPFL*,
Advised by Prof. Sabine Süsstrunk,
Project: Generalization of Neural Cellular Automata for Texture Synthesis
- Neural cellular automata is a **light-weight recurrent network** that is overfitted to synthesize a target texture. Our goal was to modify the network's architecute while keeping its simplisity to generalize it for **conditional textures sythesis**.

2021-2022 **Remote Research Intern at Information Processing and Communications Lab**, *Imperial College London*,
Advised by Prof. Deniz Gunduz,
Neural Distributed Image Compression using Common Information
- Implemented an **autoencoder**-based architecture and a **KL**-based loss function for **distributed neural image compression**. In this problem, the task is to efficiently compress an image using an encoder, while having side information at the decoder.

Honors and Awards

- Ranked 126th in nation-wide Iranian Universities Entrance Examination among more than 148000 participants (2017).

Work Experience

2024 **Research Intern at EPFL**, *https://vilab.epfl.ch*,
Physical self-supervised learning through multimodal training.

2022 **Data Science Intern at Jules Gonin Eye Hospital**, *https://www.ophtalmique.ch*,
Trained a model to predict a disease recurrence in patients using their OCT scans.

Teaching Experience

Fall 2023 **AI Product Management**, *EPFL*
Participated as a mentor in exercise classes

Spring 2023 **Image Processing II**, *EPFL*
Participated as a mentor in exercise classes

Fall 2020 **Artificial Intelligence**, *Sharif University*
Designed problems for exams and assignments, and mentored exercise classes

Fall 2020 **Linear Algebra (Practical Head)**, *Sharif University*
Designed practical problems for exams and assignments, and mentored a workshop

Skills

Machine Learning	Diffusion Models, Tokenization, Distributed Training
Library	Pytorch, Tensorflow, Ray Serve, Selenium
Software	Blender, Unreal Engine, Adobe
Frameworks	Git, Docker, Django, Android Studio, React Native
Math	Numerical Partial Differential Equations, Functional Analysis, Complex Dynamical Systems
Programming Languegs	Python, C++, C, Java, Swift, R, Javascript, Matlab

Academic Service

2024 **AAAI 2024**, *Reviewer*

2023 **CVPR 2024**, *Reviewer*

2022 **DCC 2023**, *Reviewer*

2020 **Sharif FieldIn**, *Executive Staff*

2019 **Sharif DataDays**, *Scientific, Technical and Executive Staff*

2019 **Sharif Webelopers**, *Participated as a mentor in the contest*

2018 **Sharif AI Challenge**, *Technical and Executive Staff*

Languages & Hobbies

Language	Persian (Native), English (Advanced), Azari (Fluent)
Sports	Bouldering, Tennis, Football
Art	Creative Coding